

On the Approach



Dr. Jeff DeCarlo Massachusetts Department of Transportation (MassDOT) Aeronautics Division Administrator.

Administrator's Message

Well, as far as Commonwealth aviation activities are concerned, we are really rocking and rolling! Among the many great things going on are the execution of an exciting capital projects plan, a successful airport training program, Boston heliport conversations, drone planning, and IT project management system upgrades. I would like to tell you about some of these efforts.

IT Systems Upgrade and Business Process Reengineering (BPR)

Bain and Company (2016) describes BPR as, "... the radical redesign of core business processes to achieve dramatic improvements in productivity, cycle times and quality." Let there be no question, MassDOT Aeronautics IT systems upgrades, including our airport capital programs project management system, are being implemented

concurrently with a business process analysis deep dive and BPR.

Our performance has been excellent, so why may you ask are we making such an effort? The answer is simple. Resources are scarce, and we want to ensure the optimum utilization of operational dollars, capital dollars and personnel efforts (and associated costs), well into the future. Although we are a public agency, return on investment (ROI) has to be a major part of the equation that measures success.

In order to measure success, we need optimized processes and sophisticated tools that quantify our success in what are called metrics. These metrics are the raw measures of performance that are translated and conveyed to leaders, funders and the public in a way that is understandable, via analytics. Analytics includes the data visualization, such

as multicolored graphs and charts that very clearly and concisely convey a systems performance or health. You know, green is good, yellow is not so good, and red ... well, you know what that means.

The end result of all of our IT upgrades and BPR work will be that our now fully staffed team can serve the Commonwealth even more effectively, and make every investment in our airports and elsewhere count. It will also allow us to understand how well we are doing our business in real-time.

Capital Projects "Firsts:"

State Airport

Administration Buildings – Our Airport Nerve Centers

In 2010, MassDOT Aeronautics Division (AD) published the Massachusetts Airport System Plan. The plan identified public-use airports across the Commonwealth with airport administration spaces that were deemed deficient.

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The Aeronautics Division's mission is to promote aviation throughout the Commonwealth while establishing an efficient integrated airport system that will enhance airport safety, economic development, and environmental stewardship.

Statewide Airport Administration Building (SAAB) Program

By: Thomas Mahoney (Director of Airport Engineering- MassDOT Aeronautics Division)

(Federal Aviation Administration - New England Region Program Manager)

In the spring of 2014, our Architect Fennick McGredie Architecture LTD (FMA), embarked on an ambitious schedule to complete the design and bid for Group 1 buildings as part of MassDOT Aeronautics Division's Statewide Airport Administration Building Program (SAAB) by the spring of 2015. Construction began in the summer of 2015 and completed in the summer and fall of 2016. In December 2015 and January 2016, the design of the Group 2 buildings was begun and completed in June of 2016. Group 1 Buildings are located at Beverly, Fitchburg and Mansfield Municipal Airports. The airports in North Adams, Plymouth and Taunton are in Group 2. In the 2014 Master Plan, some of the key elements that MassDOT wanted in each building were a pilot's lounge area, a conference room as well as an administration area. Additionally, it is important to MassDOT that the landscape exterior include places where the general public can come and enjoy the aviation experience.



According to Bob Mezzetti, Airport Manager at Beverly, all the elements are being utilized. Pilots are pleasantly surprised to learn about the lounge area. The conference room is constantly being used. There isn't a day that goes by that young and old are not sitting out on the benches watching the activity on the airfield. With the construction of the Admin building, the city has begun to "spruce up" the area by renovating nearby buildings, they repainted the helicopter, and even in the last snow event, treated the parking lot.

There is a hope with this program that the new building will create a vibrant center of activity. With the Group 1 buildings, I think we are well on our way to success. Beverly's successes are a good benchmark for Group 2 airports and the program in general. ➔

Welcome Kevin Moran to the MassDOT Aeronautics Division Family

By: Dr. Jeff DeCarlo (MassDOT Aeronautics Division Administrator)

I am very happy to introduce a new teammate. Kevin Moran is the new MassDOT Aeronautics Division Director of Finance and Administration. Prior to joining the Aeronautics Division, Kevin amassed almost 30 years of governmental financial experience in various positions in Commonwealth agencies.

Directly preceding his arrival, he held a senior financial management position as Business Manager at the Peabody Municipal Light Plant. Prior to that, he was the Director of the Federal Grant & Cost Accounting Bureau at the Commonwealth of Massachusetts, Office of the Comptroller. Many moons ago, Kevin actually worked for Mass Highway, but he made us promise not to divulge just how many moons ago. Kevin's broad-based wealth of experience is perfectly aligned with our short and long-term organizational objectives. His leadership, knowledge, skills, abilities, and can-do attitude will help MassDOT Aeronautics optimize our day-to-day processes and operations, while also adding new tools for performance tracking, reporting and continuous improvement. Kevin's recent experience with IT systems upgrades, as well as with business process reengineering (BPR) will be invaluable. ➔



Airport Commissioner and Manager Training

By: Dr. Jeff DeCarlo (MassDOT Aeronautics Division Administrator)

The annual MAMA Conference in Burlington was a great success and included a first. This year MAMA, MassDOT and a host of skilled presenters collaborated to conduct a much requested commissioner and manager training course. Bright and early on the Sunday before the Monday conference start day, about 70 airport stakeholders met to participate in this first-ever training. The original goal was to ensure that airport commissioners, many of whom had very little background in aviation and airports, had a chance to improve their airport related knowledge to ensure effective, active participation in airport business.

As Kathleen Mahoney developed the curriculum, she iteratively bounced the various versions off of a host of subject matter experts across the Commonwealth, and beyond. The result was a solid training curriculum. The curriculum covered Airport General, Government Agencies, Planning and Development, Grant Assurances, Registration, Airport Management, Airport Inspections, and Resources.

Concurrently with the development of the curriculum, the MAMA-MassDOT Aeronautics team handpicked the outstanding presenters for eight of the nine training modules. There was one final training module left to fill, and, oh well, the audience was stuck with me as the final presenter. I can definitely say that all of the other presenters were outstanding!

The bottom line is that we surpassed the goal of informing and equipping the commissioner group. Indeed, it became obvious that in addition to the commissioners, airport managers, consultants, FAA team members, state aeronautics team members (including me) and other stakeholders wanted to participate, learn and exchange ideas. We produced a video of the training, and are putting the final finishing touches on the edits. The training program will be available to all airport stakeholders in the Commonwealth moving forward. We hope to develop other training programs on a periodic basis.

—Overall, a great day...and oh by the way, we finished in time to enjoy a good part of the Patriots game. ➔

Gulfstream and Westfield Technical Academy- “Walk in My Boots” Program

By: Denise Garcia (Director of Aviation Planning- MassDOT Aeronautics Division)

On May 19th, Gulfstream hosted 12 high school students from the Westfield Technical Academy at their Westfield Service Center. The students received a tour of the facility with a hands-on job shadowing event with Gulfstream technicians. The effort is part of the FAA’s “Walk in My Boots” initiative aimed at introducing students to aircraft maintenance.

In early May, Westfield Technical Academy identified students with an interest in aviation. The students came from a diverse pool of vocational tracks including Automotive, Business, Allied Health, IT, and from the new aircraft maintenance technology (AMT) program which enrolled its first students this past fall. The participating students were required to submit a resume and go through a real world interview process for selection.

This program is a collaborative effort between FAA's STEM AVSED and Flight Standards offices. The program connects high schools with aviation maintenance facilities through a job shadowing experience, designed to address the shortage of skilled workers in the aviation maintenance field.

The AMT program utilizes both lecture and extensive hands on training, in labs and on aircraft, to meet the requirements of Federal Aviation Administration (FAA), Part 147. The program is comprised of three parts; General, Airframe and Power Plant. Some of the many subjects that students will receive instruction in include; Basic Electricity, Aircraft Drawings, Weights and Balance, Ground Operation and Servicing, Corrosion Control, Assembly and Rigging, Airframe Inspection, Landing Gear Systems, Hydraulic and Pneumatic Systems, Instruments, Communication and Navigation Systems, Fuel Systems, Fire Protection, Reciprocating and Turbine Engines, Ignition and Starting Systems, Exhaust and Reverser Systems, Propellers and many

others. AMT students are required to enroll in the program for all four of their high-school years. The program is open only to freshmen, and they must remain in the program to qualify for the required

Federal Aviation Administration testing to become technicians. The program is only the third of its kind at the high school level throughout the country. Jim Brough, FAA National Aviation Education Program Manager stated *“the aerospace industry will need over half a million maintenance technicians in the upcoming years. This program gives students a hands-on experience to explore this career and is a great example of government, industry, and education collaborating to both address workforce concerns and provide an exciting opportunity to all the participants.”*



Gulfstream and Westfield Technical Academy- “Walk in My Boots” Program (Cont.)

By: Denise Garcia (Director of Aviation Planning- MassDOT Aeronautics Division)

The students arrived at Gulfstream at 8:00 and spent the morning with their assigned sponsors. After sharing a pizza lunch with their mentors, FAA, MassDOT and Gulfstream employees, each student was asked to comment on what they had learnt from the experience. Their feedback was very positive. They compared the aviation practices to their automotive experience and were impressed by the high standards displayed with regard to safety, tool control, use of checklists, and the cleanliness of aircraft parts and the shop working area. Others realized that the aviation industry offers diverse career opportunities that suit many interests and backgrounds such as the correlation between IT and avionics.



The sponsors were impressed by how engaged the students were and also felt that they gained a lot from the experience. As a departing memento, each student received a Gulfstream hat and tee-shirt for their participation in the day's event before boarding the bus at 1:00 to return to their school. Upon successful completion of this program, students in the AMT program will be qualified to become certified A&P (Airframe & Power plant) mechanics, ready for a career in aviation. ✈

MassDOT Aeronautical Aviation Education Updates

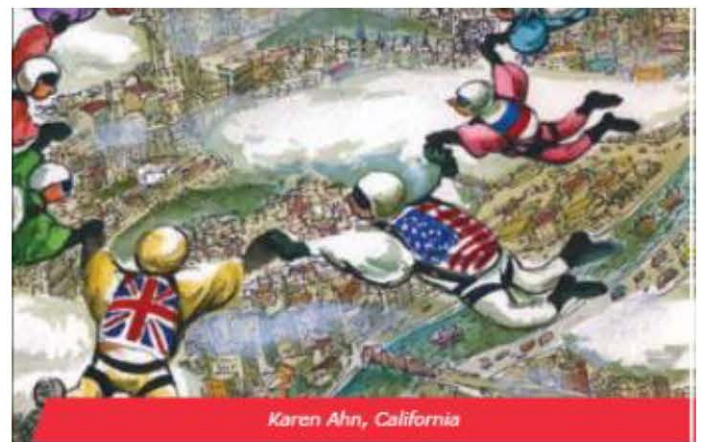
By: Steven Rawding (Aviation Planner- MassDOT Aeronautics Division)

The Aeronautics Division is again sponsoring the;

- 2017 International Aviation Art Contest and the
- 2017 Real World Design Challenge.

Art Contest:

This year's theme for the 2017 International Aviation Art Contest is “Beyond the Clouds”. Artwork will be judged for its creative use of the theme in relation to the aviation world. The contest is open to student's ages 6 thru 17 years old. There are three age groups, 6 thru 9, 10 thru 13 and 14 thru 17 years of age. The state winners will be forwarded to NASAO in Washington, D.C. to compete nationally and national winners will be forwarded to FAI Headquarters in Switzerland for international judging. The contest entries must be sent to the Aeronautics office by Friday, January 20, 2017. Feel free to contact us for brochures with contest information, contest rules and authenticity certificate.



MassDOT Aeronautical Aviation Education Updates

By: Steven Randing (Aviation Planner- MassDOT Aeronautics Division)

Real World Design Challenge:

The 2017 Real World Design Challenge is now underway. Registration ended this November and teams are working on the 2017 challenge. The State Challenge will continue the focus on unmanned systems and precision agriculture through the design and implementation of a UAS to support precision agriculture in the production of food (regional to your area). The teams will use concepts from Engineering Technology (i.e., application of science and engineering to support product improvement, industrial processes, and operational functions) to identify, compare, analyze, demonstrate, and defend the most appropriate component combinations, system/subsystem design, operational methods, and business case to support the challenge scenario.

Agricultural efficiency is poised to take a big leap with UAV/Drone technology now that the U.S. Federal Aviation Administration is streamlining regulations and issued the NEW small UAS Rule (**Part 107**) for unmanned aerial vehicles. A recent report from PwC pegs the addressable market for agricultural drones to be worth a whopping \$32.4 billion.

Teams will download and utilize professional engineering software from PTC and have access to mentors. The project will culminate with the teams completing and submitting their engineering notebook. Notebooks will be judged by professors from Embry-Riddle Aeronautical University to determine the state champion. The state winner will then work on the national challenge, which builds upon the state challenge and then in April travel to Washington, D.C. to compete nationally with an oral and PowerPoint presentation to compete for the national championship.

A big difference this year is that the RWDC State Championship team must fund their travel and arrangements to the 4-H Center to compete nationally. Feel free to contact our office for further details if you or your organization would like to participate in funding the 2017 Massachusetts RWDC State Championship team. Presently there are five Massachusetts teams competing; Brookline High School, Phillips Academy, Marlborough High School, Newburyport High School and Winchester High School.

To find out more about the Real World Design Challenge see www.realworlddesignchallenge.org →



Pavement Condition Index

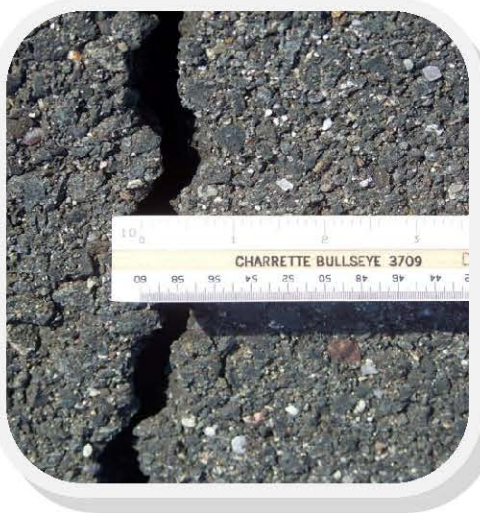
By: Owen Silbaugh (Airport Engineer- MassDOT Aeronautics Division)

In 2012, The Aeronautics Division in conjunction with the Federal Aviation Administration (FAA) performed the first state-wide Pavement Condition Index (PCI) survey. The PCI data has served as a tool for decision makers to shape Programming decision for federal and state grant aid as well as assist airport sponsors in making sound planning decisions regarding their pavements.

FAA Advisory Circular (AC) 150/5380-7B entitled "Airport Pavement Maintenance Program (PMP)" published in October 2014, requires pavement surveys to be performed yearly or every three (3) years if the PCI method (according to ASTM D5340 entitled "Standard Test Method for Airport Pavement Condition Index Surveys") is followed.

In order to comply with the FAA AC 150/5380-7B, the Aeronautics Division along with the selected consultant, Applied Pavement Technologies (APTech) and their sub-consultants, completed the field survey portion in early December. The field work began mid-October and was accomplished over six (6) separate trips starting in the

western part of the state and finished on the Cape. A total of 33 airports were surveyed not including Hanscom,



As part of the project, APTech surveyed the same sample units that were surveyed in the original PCI survey in 2012. The PCI data is reported from 0-100 with 100 representing perfect pavement and 0 representing complete pavement failure. Additionally, even pavements that are currently funded for reconstruction and pavements that are slated to receive funding in 2017, were surveyed in order to give a baseline for the deterioration. The Aeronautics Division has also contracted with APTech to calculate the Pavement Classification Number (PCN) for all airports that were required to report PCN data (according to the requirements in FAA AC 150-5335-5C, entitled "Standardized Method of Reporting Airport Pavement Strength – PCN") on the 5010 form.

The Aeronautics Division has compiled (thanks to all of the consultants) bid tabulations for all projects completed since the last PCI survey, in order to compile realistic cost data for the Maintenance and Rehabilitation (M&R) Plans.

The Aeronautics Division has also reviewed the suggested pavement maintenance and rehabilitation (M&R) activities associated with each distress type and severity. The M&R plans will provide each Airport a roadmap (with approximate cost information) for each distinct pavement area. Finally, the Aeronautics Division will hold a meeting in the late spring to present the results of the PCI survey and distribute updated PCI reports. The website will also be updated and will include all previous PCI data as well as projections of the future pavement conditions. If anyone would like more information on the project please email me at owen.silbaugh@dot.state.ma.us. ➔



Photo Wrap

By: Sara Laghlam (Airport Engineer- MassDOT Aeronautics Division)

The Massachusetts Department of Transportation (MassDOT) Aeronautics Division Staff has been out and about attending different events. From the trip to Oshkosh to the Annual MAMA conference, enjoy the following photos from events.



Aeronautics Division's Owen Silbaugh and FAA Administrator Michael Huerta at EAA Air Venture in Oshkosh, WI.



Aeronautics Division Team at the 2016 MAMA Conference Held in Burlington, MA. From Left: Jeff DeCarlo, Lorraine Bohannon, Mike Garrity, Steve Rawding, Kwame Amoah, and Titang Thompson.



Photo taken at Oshkosh by Owen Silbaugh.



NASAO's Kimberling Meets with MassDOT Aeronautics Division's Director

NASAO's Mark Kimberling, pictured with MassDOT Aeronautics Administrator Jeff DeCarlo, during a recent visit to Boston meet with staff and learn more about the work of the department. Mark and Jeff also discussed potential new education, training and research opportunities for the NASAO Center- and partnership possibilities as MassDOT proceeds with plans to institute new training modules for aeronautics commissioners and airport managers. ➔

Administrator's Message (Continued from page 1)

The term, “airport administration spaces,” does not accurately convey the importance of these facilities. At our commercial service airports, the facilities are called terminals, at our other airports they are called airport administration buildings. No matter what they are called, these facilities are truly the safety and operational **nerve centers** of our airports.

Research – MassDOT Applied Research Focused on Implementation

MassDOT has revised and improved its research programs, including a process to facilitate research and technology transfer. The research is primarily conducted through one of four programs that run the gamut from synthesis projects through new research projects, which are typically more in depth and may be able to accommodate the purchase and/or testing of equipment, material and technology.

Drone Use: MassDOT Use of Drones in Our Work

Dr. Daiheng Ni is the Principal Investigator working on a project titled, “The State of the Practice of UAS Applications in Transportation.” As he describes, “...In order to help MassDOT better achieve its mission and play a leading role in the era of technology revolution, a clear understanding of the state of the practice of UAS applications in transportation, especially among other state DOTs, is critical. The outcome of this study will enable MassDOT to position itself strategically in the near future and devise potential UAS applications that fit the current and long-term goals of the organization.” (Ni, 2016) In CY 2017, MassDOT plans to execute and evaluate a drone pilot program. We believe that the pilot study will provide strong evidence that these new tools can help MassDOT and the MBTA work safer, faster, better, and at less cost.

Drone Issues: Protecting our Airports & Corridors – Counter Drone Technology

Dr. Doug Looze is the Principal Investigator working on a project titled, “Protecting Airport Users and the Traveling Public from Drones: Current Counter-Drone Technology Solutions to Shield Airports and Approach and Departure Corridors.” As he explains, “...As more and more unmanned aircraft systems (UASs) are sold for commercial and recreational users, the risk that they will enter restricted areas and interfere with passenger flights rises. Between 2014 and 2015, the total number of undesirable encounters between UASs and manned aircrafts almost quadrupled and approached 1,000 in total. More than 300 of those can be defined as a “near-midair collision,” using FAA terminology, with other cases classified as observations reported by pilots or air traffic controllers.

While there have been no apparent “bad” intentions reported to date from UAS pilots at the time of such encounters, the statistics are alarming due to the high risks associated with midair collisions.

The objectives of this research are to accomplish a study of counter-drone technologies. A literature search will determine what technologies are currently available and are being pursued. Commercial off-the-shelf (COTS) hardware that implements these technologies will be identified, and its costs and capabilities will be described and assessed.” (Looze, 2016)

In CY 2017, MassDOT plans to consider a prototype or pilot program. We believe that we can't ignore the issue of protecting airport users and the traveling public, and need to further investigate counter-drone technology solutions.

Other Activities

I do apologize, I have run out of space in this newsletter, so will wait until next time to share many of the other exciting aviation-related activities going on in the Commonwealth. **Fly safe! →**

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